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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/900,254	07/25/1997	PETER PFEUFFER	22750/350	7919
26646	7590	09/18/2007		
KENYON & KENYON LLP ONE BROADWAY NEW YORK, NY 10004			EXAMINER TOLIN, MICHAEL A	
			ART UNIT 1733	PAPER NUMBER
			NOTIFICATION DATE 09/18/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@kenyon.com

Office Action Summary

Application No.

08/900,254

Applicant(s)

PFEUFFER, PETER

Examiner

Michael A. Tolin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim one, the term "the non-heated profiled calendar rolls" lacks proper antecedent basis. As amended, the profiled calendar rolls are heated.

Claim Rejections - 35 USC § 103

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (US 4496583) in view of Naruo (US 4876007), Norton (US 2862542), and Wydevan (US 4589983), and further in view of Jacobsen (US 5484501) or Capell (US 3679515), and further in view of Zanferrari (US 5298097) or Brock (US 3695985).

Yamamoto forms a filter sheet having excellent mechanical strength, dimensional stability, thermal resistance, and filtering properties (Abstract; column 1, lines 9-17; column 4, lines 62-68). The filter sheet of Yamamoto is made from undrawn and drawn synthetic polyester fibers (column 2, lines 64-66). Yamamoto explains that the undrawn polyester staple fibers can be fuse-bonded to each other at low temperatures without

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using a bonding material, for example, with a heated calendar roll (column 3, lines 16-21; column 5, lines 1-4; column 8, paragraph starting at line 37).

Yamamoto differs from the claims in that Yamamoto does not recite:

- I. forming spacers (pleats) in the filter sheet
- II. calendaring between profiled calendar rolls in a tension free manner in a single calendaring step to form the pleats
- III. calendaring without reheating
- IV. providing bonds of equal strength over the cross-section of the web without the use of flat bonding
- V. using sinusoidally profiled rolls
- VI. preheating the fibrous web before calendaring
- VII. heating the calendar rolls to a temperature up to the melting point of the undrawn fibers

I. Naruo teaches that filters with pleats have the advantage of increasing filtration area within a given volume, thereby increasing the filtration flow rate (column 1, lines 33-39). Norton teaches that corrugating a filter increases the filter capacity and strength of the filter element (column 1, lines 23-27). The claimed spacers do not distinguish over pleats in a filter. It would have been obvious to one of ordinary skill in the art at the time of the invention to form pleats in the filter sheet of Yamamoto because one of ordinary skill in the art would have been motivated to increase the filtration area and strength of the filter element in accordance with the teachings of Naruo and Norton.

II. Norton teaches a method of forming pleats in a thermoplastic filter sheet by providing a filter sheet which possesses an adhesive characteristic to a single set of profiled calendar rolls (column 1, lines 30-36; column 2, lines 66-72; Figures 1 and 2). In the case of a thermoplastic filter sheet, this would require that the filter sheet is in a heated state prior to calendaring because thermoplastics are adhesive when they are heated. Since Norton is silent on applying tension to the web and since Norton's figures do not show means for pulling the filter sheet, it is clear that Norton's method is performed in a tension free manner. It would have been obvious to one of ordinary skill in the art at the time of the invention to form pleats in the filter sheet of Yamamoto using the method of Norton because one of ordinary skill in the art would have been motivated to form the pleats in any known and suitable manner, such as that taught by Norton.

III. Norton does not teach a step of reheating. Since the desired corrugated filter element is formed in a single calendaring operation, one of ordinary skill would not expect to perform a reheating step after calendaring in the process of Norton. It would have been obvious to one of ordinary skill in the art at the time of the invention not to add a reheating step to the process of calendaring the filter sheet of Yamamoto using the teachings of Norton because one of ordinary skill in the art would have been motivated to save the cost associated with performing an unnecessary step.

IV. Regarding the limitation of avoiding flat bonding and providing bonds of equal strength over the cross-section of the fabric, these limitations are inherent in the method of forming pleats in the filter sheet of Yamamoto using the teachings of Norton.

Applicant's specification explains on page 2, paragraph 2, that flat bonding is avoided

by bonding in a tension-free manner between profiled calendar rolls without inhomogeneities over the cross-section of the fabric. It is not explicitly clear from the specification what is meant by inhomogeneities, but one of ordinary skill in the art would have read this term to indicate the raised portions on typical embossing and point bonding rolls. Norton does not teach such raised portions, Norton's figures do not show raised portions, and furthermore Norton teaches that it is undesirable to adversely affect the porosity or filtering capacity of the paper (column 1, lines 29-30). The use of raised portions on the rolls would clearly produce flat spots which adversely affect filtering capacity of the paper. The examiner's position is that one of ordinary skill in the art reading Norton would expect that the raised portions, or inhomogeneities, typical of embossing and point bonding rolls are not present in the rolls of Norton for these reasons. As to the limitation of providing bonds of equal strength over the cross-section, such flows naturally from the use of profiled rolls without inhomogeneities. While it is not explicitly clear from the specification what is meant by bonds of equal strength, one of ordinary skill reading the specification would have understood bonds of equal strength to be contrasted with the discrete bonds formed by the raised portions of typical embossing or point bonding rolls. Since there are no such inhomogeneities in the method of Norton, as explained above, it follows that the bonds formed by Norton are inherently of equal strength over the cross-section of the fabric.

V. Norton does not explicitly recite sinusoidally profiled rolls. Norton does explain that the corrugations shown in Figure 2 are curved and other profiles are suitable as well (column 3, lines 11-16). The examiner's first position is that the profile

shown in Figure 2 of Norton is clearly sinusoidal because one of ordinary skill in the art looking at the curved profile shown in Figure 2 would note that it has the same shape as a sine curve. The examiner's second position is that the term sinusoidal requires no more than an "undulating curve" which is clearly taught by Norton. The specification does not specifically require that the sinusoidal profile is identical to a curve produced by the mathematical sine function. Accordingly, one of ordinary skill in the art reading Applicant's specification would not have associated any criticality with using an exact sine curve and would have taken the term sinusoidal to be an undulating curve. The examiner's third position is that Wydevan provides motivation to use sinusoidal pleats. Wydevan explains that sinusoidal pleats in a filter appear to maximize the filtering surface available and thereby increase filtering capacity (column 4, lines 30-36). According the examiner's third position, it would have been obvious to one of ordinary skill in the art to use sinusoidally profiled rolls in the method of Norton because one of ordinary skill in the art would have been motivated to produce sinusoidal pleats which maximize the filtering surface and thereby increase filtering capacity in accordance with the teachings of Wydevan.

Norton does not recite bonding with heated rolls. However, one of ordinary skill in the art would have readily appreciated that there are only two possibilities for achieving the desired bonding, providing a heated sheet or providing heated rolls. The thermal energy required for bonding must be provided in one of these two ways. Given the very limited possibilities, it is well within the level of ordinary skill in the art to choose between these two possibilities as a matter of routine engineering. It would have been

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obvious to one of ordinary skill in the art at the time of the invention to bond with heated rolls because one of ordinary skill in the art would have been motivated to select one of the two possible bonding methods as a matter of routine design choice. Furthermore, as set forth below, bonding with heated rolls is generally well known, and as noted above, Yamamoto teaches bonding with a heated calendar roll.

VI. Norton does not teach preheating in combination with heated rolls. However, such a combination is generally well known in order to increase the production speed in a thermal bonding operation. This follows from general principles of thermal transfer. When a web is passed between 2 rolls for thermal bonding, heat must be transferred from the rolls to the web in order for bonding to occur. If the web is cool, more heat must be transferred, and therefore the web must spend a longer time between the two rolls. In order to spend a longer time between the rolls, the web must be traveling more slowly. For example, in a bonding operation between heated rolls Jacobsen explains that fast line speeds may require preheating (column 5, lines 45-67; column 6, lines 3-9). In a bonding operation between heated rolls, Capell teaches that increased conveying speeds can be used with preheating (column 3, lines 63-67; column 4, lines 43-45). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the claimed step of preheating because one of ordinary skill in the art would have been motivated to increase production speed in accordance with general principles of thermal transfer as evidenced by Jacobsen or Capell.

VII. As to the limitation of heating the rolls up to the melting point of the undrawn fibers, Yamamoto explains it is the undrawn fibers which are fuse-bonded (column 3,

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lines 16-21). One of ordinary skill in the art would have readily appreciated that melting of the fibers would cause them to flow and block filter pores, thereby decreasing filter capacity. It is generally well known to bond fibers by heating them below their melting point. In a process of bonding fibers, Zanferrari explains a heated roll should be heated to a temperature below the melting point of the web, but sufficient to soften the web to provide sufficient bonding sites when pressure is applied to the web (column 4, lines 52-58). In a process of bonding a fibrous web between heated rolls, Brock explains the surface temperature of the rolls is controlled to cause sufficient heating without melting or degradation of the web (column 5, lines 62-75; column 6, lines 1-5). It would have been obvious to one of ordinary skill in the art to heat the rolls to a temperature below the melting point of the undrawn fibers because one of ordinary skill in the art would have been motivated to provide sufficient bonding without causing the fibers to melt because melting would reduce filter capacity, and bonding without melting is well known as evidenced by Zanferrari or Brock.

Response to Arguments

4. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

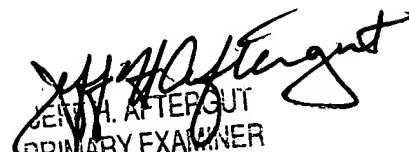
5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Michael A. Tolin** whose telephone number is **571-272-8633**. The examiner can normally be reached on **M-F 9am to 5:30pm**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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